Less Meat Campus Strategy

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Group 9

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Executive Summary

This project focuses on the reduction of meat consumption on University of British Columbia (UBC) campus in regards to reducing food-based greenhouse gas emissions (GHG); particularly the emphasis on beef and lamb. This project works in accordance with the goals set by the UBC Climate Action Plan (CAP) which aims to become a net energy producer by 2050. Previous LFS 450 groups have conducted food life cycle assessment plans that closely examined GHG emission factors to make sustainable recommendations to food purchases for UBC. Our project primarily focused on reasons behind high consumption of beef and lamb, the acceptability of proposed alternative methods to campus consumers, and future recommendations and strategies to food service stakeholders to better reduce meat consumption.

We have conducted active research with a focus on sustainable food strategies such as Meatless Mondays, smaller portion sizes of lamb and beef, lower prices but less meat, alternative meat options offering chicken, pork, or fish and lastly, more vegetarian options like tofu, soy or beans. Next, we conducted an in-person survey at the major food service locations to get a response on student preferences and food choices on campus. In addition, we interviewed with UBC food service stakeholder Lillian Zaremba for a better representation of popular food items that are consumed daily and how the food outlets operated in terms of serving lamb and beef. Suggestions made include portion control, better meat alternatives and other alterations were suggested. Our project's goal is not to eliminate meat on campus which will negatively impact sales, instead we want to maintain consumer preferences in menu items but also offer alternative meat options that are lower in GHG emissions.

There were a total of 138 surveyed responses and on average each participant consumed 7.7 meals per week where 27.4% of those meals contained lamb or beef. The suggested

interventions were not favored by all participants. The intervention most acceptable to consumers was replacing a greater proportion of lamb and beef with other meat alternatives such as chicken, pork or fish. The second most popular intervention was the reduced portion size of lamb and beef with a reduced price as well. The third and fourth most acceptable option was the increased portion of vegetable substitutes. “Meatless Monday” (a certain day of the week where no meat is served at any food services) posed to be the least favored option among consumers. The top reasons for not choosing vegetarian meals from both the female and male consumers were taste, while secondary reasons varied from preference to price. Also, males consumed more meals on campus compared to females. Students from the faculty of Applied Science consumed a higher number of meals followed by Arts, Sauder, Land and Food Systems and Science. This may be a result of convenience of food services that are nearby offering a higher portion of meat options. However, Sauder students had the highest percentage of meals consumed containing lamb or beef. The majority of participants were mainly first year resident students found at Vanier and Totem Residences who showed a higher consumption of meals on campus due to meal plan options. Given the nature of our study, the recommendations we make are broad in scope and thus future LFS studies should further improve and narrow these recommendations.

Introduction

Global meat production continues to grow and poses many food related environmental issues due to the inefficient conversion of animal feed into dietary protein (Boer, Schosler & Aiking, 2014). High meat consumption is responsible for environmental pressures such as the greenhouse gas (GHG) emissions, disruption of the nitrogen cycle and land use changes (Boer et. al., 2014). With the continuum of animals being the major source of protein in most diets, there will likely be an increased risk to the public health as high consumption of red meat induces cardiovascular diseases, diabetes, and some forms of cancers (Boer et. al., 2014). As low calorie diets are decreasing worldwide, there has been a shift towards more balanced diets that include more meat-rich meals, especially in developed countries (Pradhan, Reusser & Kropp, 2013).

The focus of this project is to create awareness regarding the negative impacts of livestock productions on the environment and introduce better meat alternatives for the consumers who use UBC food services. The majority of the consumers on campus are students who eat according to their preference, taste or convenience without considering the cost or quality of the meat products offered. Our preliminary literature review on previous LFS FSP reports showed that according to full life cycle assessments of various food items, lamb and beef are top two contributors to greenhouse gases. In this regard, we deemed that the reduction of lamb and beef is crucial to reducing greenhouse gas emissions at UBC. The goal of our project is to implement strategies to reduce the amount of meat consumption, in particular lamb and beef, and offer a variety of other beneficial alternatives such as chicken or pork without impacting UBC food service revenues and consumer preferences.

Consumers value taste, cost and convenience and believe that specific meat proteins are beneficial to health and the food services look towards satisfying these consumer needs in a more sustainable and economically friendly manner. This may include looking for local producers and organic distributors to reduce the carbon footprint of the meat products as well as ensure quality standards.

Our group focuses on providing options that is ethnically diverse, affordable, safe and nutritious while reducing the GHG emissions on campus. We want to recommend providers and educators to promote awareness on campus to consumers about the diet changes that can be changed without sacrificing their preferences in food choices. This may change in consideration of GHG emissions or animal welfare namely how the animals were slaughtered or transported to our food services. Lastly, we would like to address that our interventions are economically sustainable and affordable to the UBCFS and consumers who are mostly students in this case.

Methods

The initial course of action we did as a group after we received our formal project initiatives were to do the preliminary literature reviews on previous years' project and Climate Action Plan, which our project is rooted upon. These projects provided background information of our project, helping us refine our project objectives and formulate future courses of action.

Then the first action of our project was to get a better understanding of how the food services on campus functioned, in particular, how portion size of lamb and beef were determined and served to the consumers. Our group started with an in-person interview with Lillian Zaremba -the former Climate and Energy Engineer-, our primary contact person. During the meeting, we discussed that student preferences are a major determinant of what food services sell to

consumers and thus meat inventories are purchased based on what is demanded and consumed the most by students. We also discussed the current food service practices in terms of who determines how much meat will be served in a typical entree, specifically at the Totem and Vanier cafeterias. The problem is sometimes as simple as just the size of scoops that were used in serving the meat. Because the kitchen did not have a 3 oz cup, the staff used a 6 oz cup instead that lead to serving greater portion of meat products than necessary. This has suggested that cafeteria kitchens may require an update towards their kitchen utensils and thus can help reduce the portion of meat served. Next, some of our group members conducted an observational study at lunch time and observed student behavior and choices in terms of their meal purchases at the Totem and Vanier dining halls. By observation, many consumers seemed to have some form of meat product in their meals. This did not necessarily constitute solely beef and lamb, chicken and pork were chosen quite often.

A literature review portion was conducted in order to review less-meat strategies employed by other campuses and organizations. The objective of reviewing literature was to gain insight into some of the most successful practices towards meat reduction that can be adapted at UBC considering its own unique and diverse food system and community. We reviewed some of the strategies on other campuses as well as corporations with sustainable food system plans. Search terms included the following: University, college, corporation, meat reduction, GHG, red meat, sustainable food plan. Research was also conducted on consumer preferences towards meat consumption. Search terms included the following: Consumer, survey, poll, North America, meat consumption, vegetarian.

Among numerous search results, we concentrated on peer reviewed articles and articles/ web pages from other universities and campuses as our primary resources. Through the

literature review, we came across strategies such as Meatless Mondays, reduction of portion size in entrees and replacement of lamb and beef with other meat alternatives. We selected potential strategy that can be implemented at UBC to focus on introducing variety of interventions that offer better and healthier choices of meat alternatives to consumers instead of taking away their choices of meat consumption on campus. We also needed to consider the revenue that these meat products bring to food system outlets since economic sustainability is an equally important area of consideration, while considering ecological sustainability and how UBC can reduce lamb and beef consumption and subsequently reduce GHG emission from these GHG-intensive food sources.

Lastly, our group has decided to conduct an in-person paper survey that is comprised of questions regarding the frequencies consumers visited a food service location throughout the week and what proportion of their meals consisted of lamb and beef. We believe an in-person survey would be a quick and direct method that would facilitate a higher response rate. Our group conducted surveys at four different food service locations including: Totem Park Cafeteria, Vanier Residence, the Student Union Building and Irving K. Barber Learning Centre. These spread of locations would allow us to capture responses from a variety of consumers across the major food service locations and get a better understanding of how influential food services can be towards consumers reducing their lamb and beef intake. The survey also included five different interventions where consumers rated each using a scale of 1 (least acceptable) to 5 (most acceptable) based on what they felt was the most acceptable intervention that could be enforced on campus. The surveys were conducted on different weekdays mostly around 12pm (lunch time) and we approached participants randomly. In total, our survey sample size totaled 138 participants. Some consumers did not want to participate in our study, thus we only surveyed

individuals who had time and were willing to complete the survey. This was a type of convenience sampling-method of sampling individuals where location and collected data is based on convenience. This may introduce bias as individuals at the specific location may have consumed more meat if the food service at that location had a menu comprising of a variety of meat products. Also, we were only able to collect data from individuals who participated in our survey and these individuals may be people who showed interest in our research topic. They may be individuals who want to make a difference in reducing meat consumption or have knowledge on what high consumption of meat products imposes on the environment. This could bias our data to only include individuals that showed interests and exclude those who did not participate.

Findings & Discussion: Literature Review

As a means of reducing GHG emissions, our group examined methods in which the UBC may reduce overall consumption of beef and lamb – the top two greenhouse gas contributors on UBC campus. Through literature reviews, we hoped to investigate various less-meat strategies that are practiced on Canadian and United States campuses along with corporate and community entities; this would allow us to determine which less-meat strategies may be adopted at UBC to reduce lamb and beef consumption, and ultimately reduce GHG emission from UBC food system. Furthermore, we also researched consumer sentiments towards this topic to gain better understanding of consumer behaviors and preferences towards meat consumption and ways to reduce meat. Using these findings from literature reviews as an informative template, it helped us analyze survey results obtained during our active research and make comprehensive suggestions with proper reasoning.

To begin with, we first explored what other universities, campuses and other communities are doing to reduce meat consumption. Through our research, we hoped to find

information on the best practice in reducing meat consumption that has been practiced at other places to possibly apply this information at UBC, however, there were surprisingly limited work done on how successful or applicable these strategies are at reducing meat consumption at their food system outlets or elsewhere. However, what we did find was that a lot of universities and college do have various initiatives that directly and indirectly target to reduce meat consumption. We could roughly categorize these strategies into four main strategies: Meatless Monday, reduced portion of meat in the entree, replacement of meat for other meat alternatives, and replacement of meat for vegetables.

Perhaps one of the most widely practiced strategies of reducing meat consumption is promoting vegetarian options across the campus.

Vegan and Vegetarian Directory is a service provided by the York Animal Rights Group from the York University for more eco-friendly and sustainable food systems (York University, n.d.). This Vegan and Vegetarian Directory show which vegetarian or vegan options are available from various food providers throughout the York University campus. Through the survey, they have found that many of the respondents wanted more vegetarian or vegan options, however, the main problem was accessibility and knowing where to look for vegetarian and vegan options. Similarly, through our surveying of UBC food system participants, we also observed that accessibility and limited vegetarian option was one of the issues that limits consumers from choosing vegetarian entrees over meat-based entrees.

The University of Victoria has eating green initiatives where they offer various vegetarian menus at the Village Green vegetarian restaurant (University Of Victoria, n.d.). By offering more vegetarian options and encouraging students and staff to eat green, they are reducing University of Victoria's ecological footprint.

Similarly, Humber North Campus celebrates World Vegetarian Day on October 3rd at the North campus (Humber, 2013). By educating the community about the benefits of plant-based diet and sustainability of locally and organically grown foods, this event focuses on initiating changes from their food system participants for more sustainable environment and healthier individuals. Although this event does not focus directly on reducing meat consumption, if any consumer chooses to prefer more vegetarian options, this indirectly helps to reduce meat consumption in the end. We believe events like this have potential to provoke positive change around the campus and thus suggest having similar events at UBC campus. Compare to Meatless Monday which is somewhat random and often misleading, by participating in an event celebrated around the world and being educated on the reasoning behind those events, individuals may better understand the objective and feel more related.

Kingston University have comprehensive Food Policy which strives to reduce environmental, ethical and social impacts from food products and services and provide healthier and more sustainable food system for staff, students and visitors at campus (Kingston University, 2015). Among various objectives, serving appropriate portion size, reducing the sale of red meat and dairy products and promote vegetarian options, sourcing meat and dairy from certified, reputable source that meets the animal welfare standard, increasing the proportion of MSC certified fish all either indirectly or directly affects meat consumption. However, there is limited information on which of these strategies are actually successful at reducing meat consumption.

Cornell University [USA] was ranked #2 in "PETA's most vegan-friendly colleges" in 2012 (Cornell University, n.d.). Their food outlets are stated to include clear labeling of vegetarian/vegan items, and they also boast a full café with 'only vegetarian and vegan options' (Cornell University, n.d.). Reviews of other campus website pages suggest that there is a general

emphasis on marketing / education / public awareness in order to reduce meat consumption of individuals.

Events like 'Meatless Monday' try to reduce the prevalence of meat options, and instead promote entrees with alternative protein sources. Sodexo North America released information following a year of Meatless Mondays (Hopkins, 2012). This source was the most 'complete' by far, with information acquired via survey and retail data after a year of Meatless Monday events. Sodexo noted that 19% of food outlets marked an increase in overall sales, while 30% noted a decrease in overall sales; this in itself should be a strong indicator that UBC should use a different approach to limit food-related GHG output (Hopkins, 2012). The opportunity cost for this event is too high, and resources may be better spent on more popular strategies which would be less detrimental to food sales (Hopkins, 2012).

Although there is sparse information available on best practices currently adopted by organizations, there is a good amount of recent research done on this topic – much of it focused on consumer behavior. A series of surveys conducted in the Netherlands analyzed consumer behavior and preferences toward meat products (Dagevos & Voordow, 2013). Researchers suggested that incremental strategies are most effective at reducing consumer meat consumption (Dagevos & Voordow, 2013). The study noted that there is a significant portion of the population that actively seeks to reduce their own meat consumption. In fact, researchers noted that "a large majority (69.5%) did not eat meat at least once per week" (Dagevos & Voordow, 2013). It is interesting to note that beef ranked very high (#2) in a meat popularity poll by people classified as heavy meat eaters; this may suggest that food outlets should be careful with outright substituting beef for alternative protein source, such as other meats or soy products (Dagevos & Voordow, 2013). On a similar note, chicken was a very popular food with survey

respondents: Chicken was ranked as #1 for "heavy meat eaters" and #2 for consumers seeking to reduce meat intake (Dagevos & Voordow, 2013).

In another study, researchers investigated strategies to reduce meat since meat is critical to sustainability; meat products are one of the most "energy-intensive and ecologically burdensome foods" (Dagevos & Voordouw, 2013). Based on their finding, they have suggested incremental strategy as an appropriate strategy to reduce meat consumption in consideration of public-policy in European countries. Incremental strategy is gradualist strategy that enables, encourages, exemplifies and engages changes to influence consumer's food choices through proper governance interventions instead of hard policies (Dagevos & Voordouw, 2013). Consumers are believed to react negatively to sustainability arguments with respect to meat consumption, and thus consumer participation is limited in such cases (Bakker & Dagevos, 2012). Researchers suggested a strong need for "behavioral / cultural" changes but were skeptical on moral / ethical arguments to create more sustainable consumers (Bakker & Dagevos, 2012). This is further compounded by market strategies of industries and producers which often have different values (Bakker & Dagevos, 2012). Researchers noted that consumers can be fairly passive and "do not generally concern themselves with difficult questions about food and feel no real need to do so" (Bakker & Dagevos, 2012). We believe it is important to make the same underlying assumption on UBC consumers, rather than assume otherwise.

Flynn (2013) had found that with increased meatless meals around the America – "meatless spectrum" is especially popular among college students-, there are observable decline in meat consumption across the U.S. This trend is partly due to rising price and bad economy, coupled with overall association of red meat to various health issues such as stroke, cancer and heart attacks. Either by having smaller portion size of meats or reducing meat entrees once or

twice a week, meat consumption has declined among Americans, as well as there also has been cases in which consumers switch from red meat to poultry that further reduce red-meat consumption across the nation.

A particularly relevant study examined food trends in the Canadian food system (Hopkins, 2012). The concept of the "educated consumer" is becoming more prevalent, as animal ethics and health concerns alter eating habits (Hopkins, 2012). Red meat consumption is seen to be steadily declining: There is a marked decline of 16% from the 1980's to 2003 (Hopkins, 2012). Interestingly, chicken showed a steady increase; price is believed to be strongly correlated with this movement, as prices of poultry decrease while beef increases (Hopkins, 2012).

Survey Results

There were 138 surveyed responses in total. We have analyzed the data based on participants' sex, Faculty and Year. Overall, an average participant consumes 7.7 meals on campus per person per week, and 27.4% of those meals contain lamb or beef. These data was based on the participant's own response, and not based on UBC Food Services statistics.

As outlined in Table 1 below, the strategy that was most favorable by all of the participants for reducing lamb and beef consumption was fewer lamb and beef entrees, but substituted with other meat options, such as chicken, fish or pork. The second most popular strategy was having lower priced smaller portions of lamb and beef options. The third and fourth favorable strategies were smaller portion of lamb and beef, but substituted with more vegetables, and fewer beef and lamb entrees, but more vegetarian options. The least acceptable strategy was "Meatless Monday" – which simply means that there would be a day in a week when no lamb or beef would be sold in UBC food outlets.

Strategies to reduce Lamb and Beef consumption on campus	
1	Fewer lamb and beef entrees, substituted by different meat options (chicken, fish, pork etc.)
2	Smaller portions of lamb and beef, and lower priced entrée
3	Smaller portions of lamb and beef, and more vegetables
4	Fewer lamb and beef entrees, but more vegetarian options (with other protein sources eg. Beans, soy, tofu etc.)
5	"Meatless Mondays"

Table 1. Popularity of strategies to reduce lamb and beef consumption on campus

Students' responses to the open-ended questions *"What are some things that discourage you from choosing vegetarian meals at UBC?"* and "*If you choose a meat entrée at UBC, what makes you choose meat instead of a vegetarian option?"* were summarized into nine categories consisting of: convenience, preference, taste, price, nutrition (source of protein), variety, fullness, not discouraged and others (allergies, habit, portion size, quality, freshness, did not know or lacked a response).

Table 2 highlights the top three reasons for not choosing vegetarian menus were taste, preference and price, ranked respectively. Similarly, Table 3 shows that the top four reasons for choosing meat menus were taste, preference, and nutrition and fullness sharing the same score.

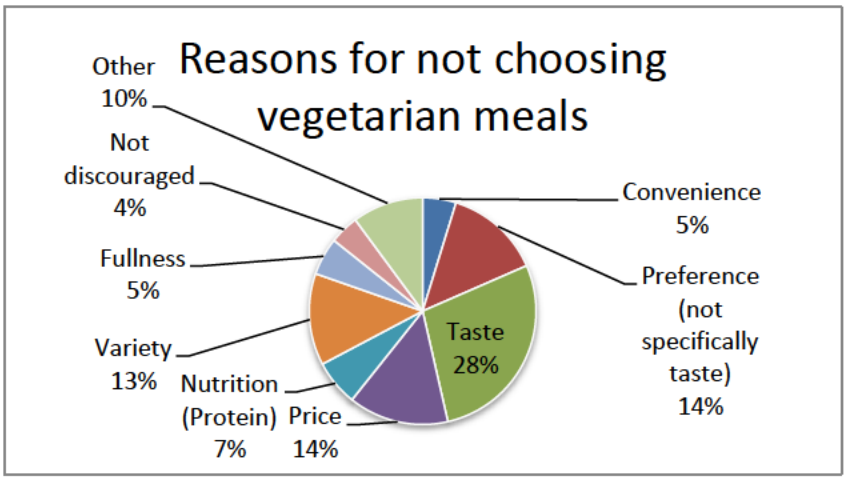


Table 2. Percentage distribution for reasons for not choosing vegetarian meals (Overall analysis)

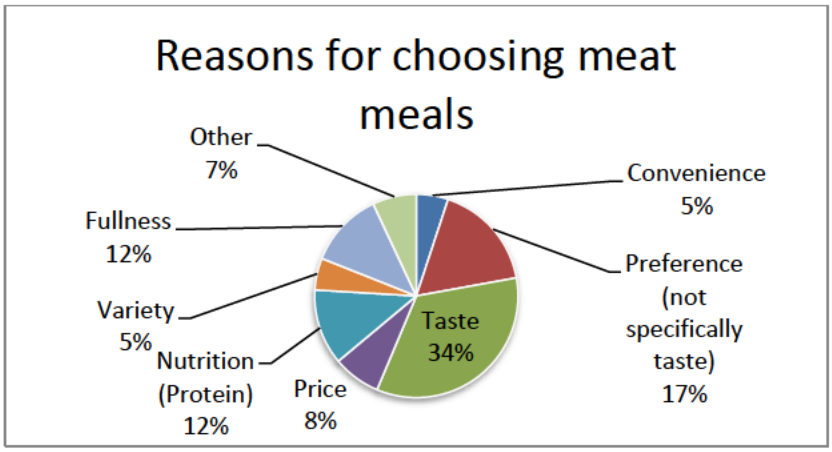


Table 3. Percentage distribution of reasons for choosing meat meals

In distinguishing gender relationships in the data, it was determined that males consumed more meals on campus, and consumed a higher percentage of beef and lamb than females. As seen in Table 4, males consume on average 8.9 meals/ week and females consumed 6.8 meals/ week on campus. The percentage of those meals containing lamb or beef was 37.4% for males and 20.3% for females.

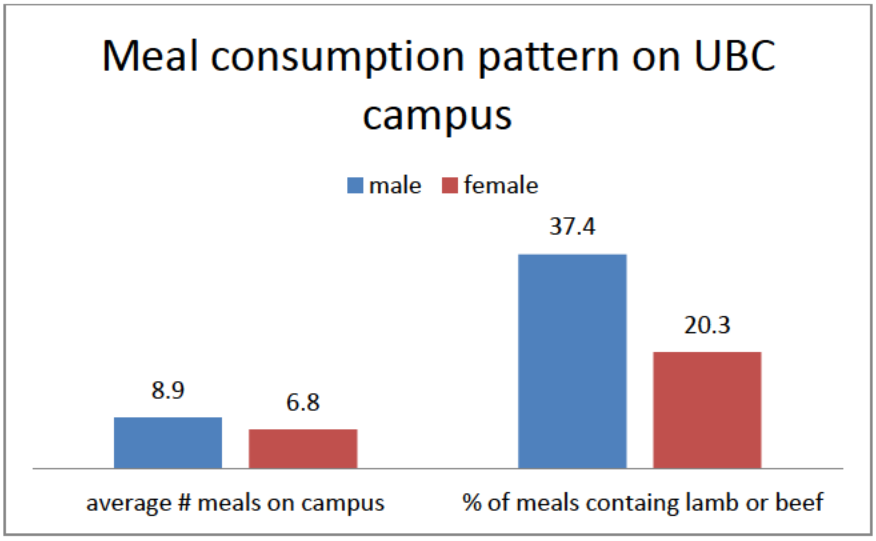


Table 4. Male and female meal consumption pattern on UBC campus

Data also suggests females had a higher acceptability to all of the suggested meat reduction strategies compared to males. But the most favorable strategy for both male and females was fewer beef and lamb entrees substituted by other meat options (ex. chicken, fish or pork). (Table 5)

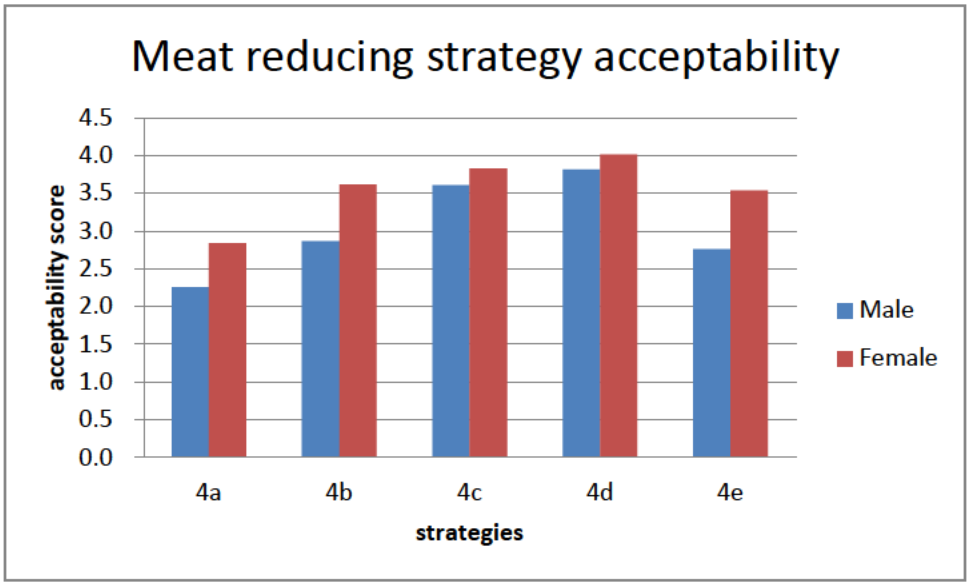


Table 5. Male and female comparison of acceptability of the suggested meat reducing strategies

The top one reason for not choosing vegetarian meals stated by both males and females was taste. The second most popular reason in males was preference, while in females was price. The top two reasons for choosing meat menus in males were also taste and preference, while in females, they were taste followed by nutrition. (Table 6 and 7)

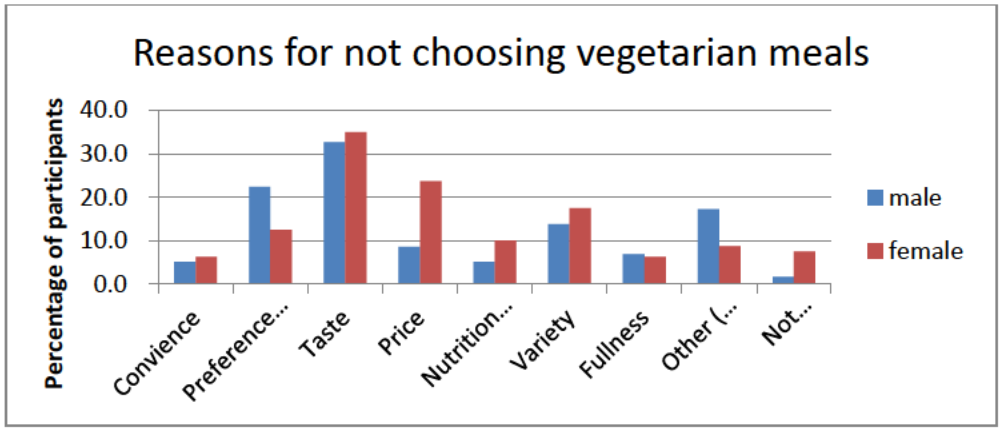


Table 6. Reasons for not choosing vegetarian meals- male and female distributions

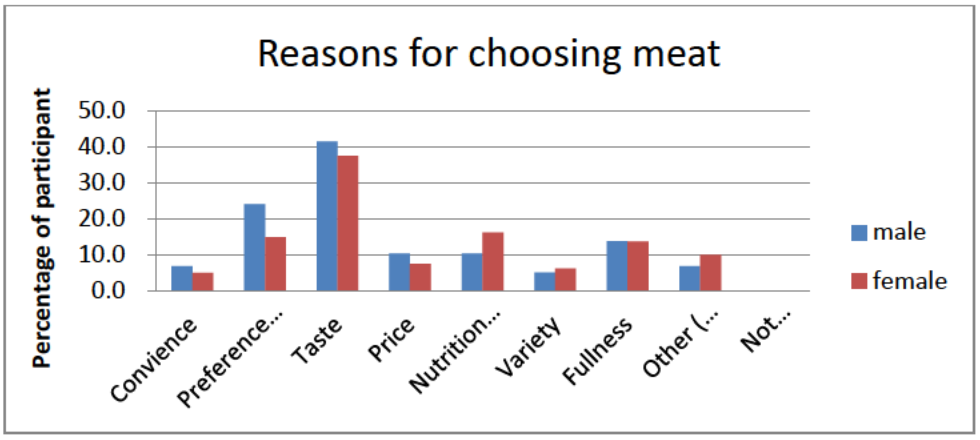


Table 7. Reasons for choosing meat menus - male and female distributions

On average, students from the Applied Science faculty consumed the highest number of meals on campus, followed by Arts, Sauder, Land and Food Science, Science and Others. Sauder students had the highest percentage of meals consumed on campus containing lamb or beef, followed by Applied Science, Science, LFS, Arts students. (Table 8)

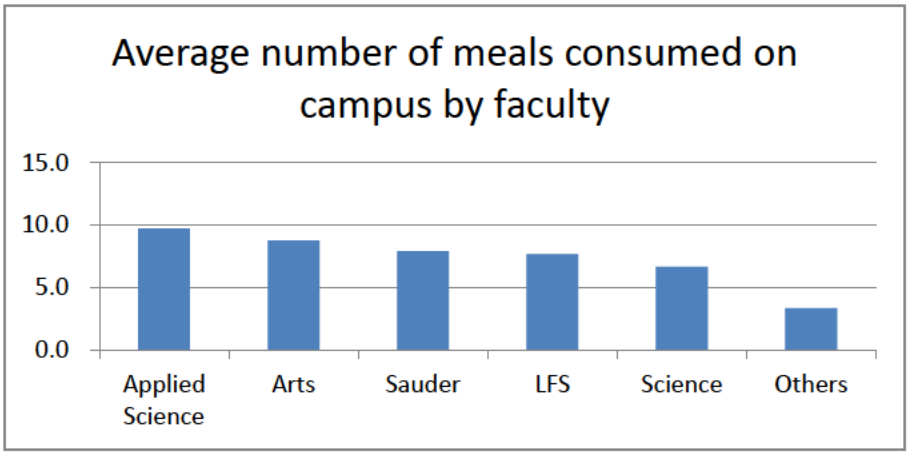


Table 8. Average number of meals consumed on campus by faculty

There was no clear trend in the reasons for not choosing vegetarian meals or reasons for choosing meat menus by faculty. Trends were best determined based on overall analysis and between male/female comparisons. (Table 9)

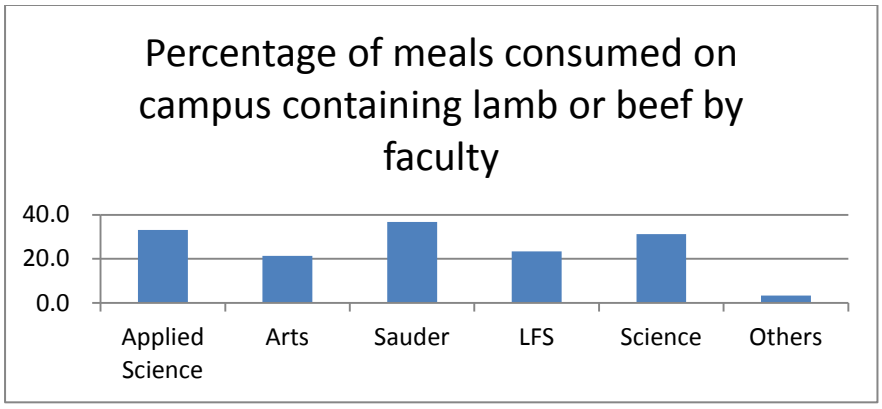


Table 9. Percentage of meals consumed on campus containing lamb or beef by faculty

Results showed that first year undergraduate students consumed the highest number of meals on campus, averaging 13.8 meals/week, while students from second, third, fourth or higher years, graduate students and faculty/staff showed similar results, around 3-5 meals/week. Results also showed that all undergraduate students consumed similar amounts of lamb and beef, averaging around 28% of the meals they consume on campus. Graduate students consumed less lamb and beef compared to undergraduate students, with an average of 18% of their meals on campus containing lamb or beef. The percentage of meals containing lamb or beef consumed by other students (exchange or diploma students) was very high as well, with a percentage of 41.7%. (Table 10)

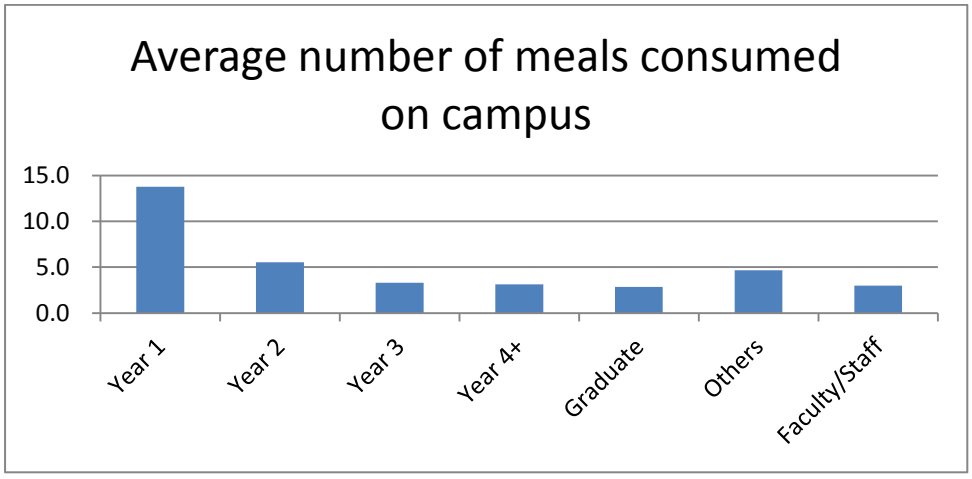


Table 10. Average number of meals consumed on campus by year of program

The top two reasons for not choosing vegetarian menus and reasons for choosing meat menus in undergraduate student was again taste and preference, which was consistent with the initial overall analysis. There was no clear trend in graduate students, other students and faculty/staff due to the small sample size. (Table 11)

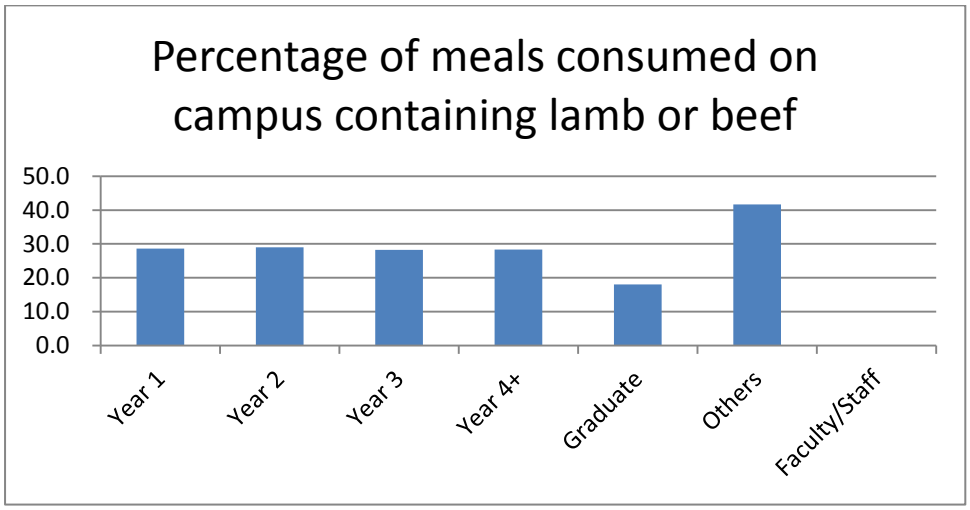


Table 11. Percentage of meals consumed on campus containing lamb or beef by year of program

Discussion

Demographic:

We chose the campus locations where we administered our surveys with the intention of capturing a large cross section of the UBC population. We surveyed students at 4 locations: the UBC Student Union Building (SUB), the Irving K Barber Learning Centre, Place Vanier Residence cafeteria, and Totem Park Residence cafeteria. We expected a large proportion of first year students to be represented in our results as the two residence buildings have a high population of first year students. We hoped that the other locations (SUB and Irving K Barber) would have a more balanced representation of the UBC population. However, at 31% of all participants, first year students are by far the largest group represented. With the exception of The Faculty of Forestry, the distribution of students tends to be much more even across the years

of study. (University of British Columbia, 2014) However, as students who live in campus residence buildings often buy into campus meal plans, and consume a greater number of meals on campus. The average number of meals consumed by the first year students surveyed is 13.8, while the average number of meals consumed on campus by students in other years range from 2.8 to 5.6. There therefore may be some value in having the opinions of first year students towards meat reductions strategies having a stronger weight in the survey results. A reduction of lamb and beef in the eating habits of first year students would have a greater impact on campus GHG emissions than in any other single group of students.

There are also a greater number of female survey participants to male. Female participants account for 58% of all individuals surveyed. However, of all students registered at UBC as of November 1, 2013, 54% are female, so while female students are slightly overrepresented in our survey, it is not by much (UBC Enrolment Statistics)

Survey Results:

Questions one, two, and three were designed to better understand the food habits of the UBC population. Of 138 participants, only 10 identified themselves as vegetarian, suggesting that the vast majority of UBC students include meat in their diets. According to our findings, 27.4% of the meals consumed from campus food outlets per week contain lamb or beef. The UBC Campus Sustainability Report GHG Inventory does not account for GHG emissions from any food sources, so the actual GHG emissions associated with this lamb and beef consumption is unknown (University of British Columbia, 2012). However, as these two meat items are included in close to one third of the meals consumed on campus, and the GHG emissions associated with lamb and beef production have been shown to be high. A reduction of these

meals would have a sizeable impact on the GHG impact of UBC, but a more detailed accounting is necessary to know the full impact.

The fourth question asked participants to rate the 5 possible lamb and beef reductions strategies to determine which would be most acceptable to them. The top ranked option was fewer lamb and beef options, but more options which included meat options with a lower associated GHG cost (such as chicken, fish, or pork). The least favorable option was a "Meatless Monday". This was framed in a way where there would be no lamb or beef offered at UBC campus food outlets. As we presented Meatless Monday as only an absence of lamb and beef (other meat options would be available) is interesting that these two strategies would actually be quite similar in practice. We can infer from these results that meat options are highly valued by the UBC population. Framing a meat reduction strategy as being meatless resonates unfavorably. The second most acceptable option was smaller portions of lamb and beef, compensated by a lower price. This again shows how highly meat is valued, and it shows that price is a motivating factor in decision making. Participants ranked a smaller meal with a lower price as more acceptable than an equal sized meal with a higher proportion of vegetables.

The last two questions were open ended and designed to capture two different aspects of the meal time decision making process. We wanted to know what factors *discouraged* students from choosing vegetarian options and which were *encouraging* students to choose meat options. However the answers to these questions were extremely similar and were distributed in a similar way. Many participants wrote things such as "see above answer", or "same as above" for the second of these questions. If we were to revisit this survey we would likely reword one of these questions. It may have been more useful to ask: What are some things that encourage you to choose vegetarian options, when you choose vegetarian options?

Taste and preference were by far the two greatest reasons for both not choosing vegetarian, and for choosing meat (42% and 51% respectively). Many of the responses were things like "I just like meat" and/ or "I don't like vegetables". This shows an ingrained desire for meat consumption, but it is impossible to tell from our results if this is a cultural or inherent attitude. After taste and preference, many participants listed lack of variety, and higher prices as reasons that discouraged them from choosing vegetarian options. There is a perceived lack of vegetarian options, many answers were statements like "few options" and "poor quality, lack of choice". There is also a perceived lack of value of vegetarian meals. Some of the answers regarding price were, for example, "expensive", or "for the same price I could get meat". It would be an interesting subject for further study to see if these ideas are just perceived notions, or if there are reasons why they hold true. If they are true, effort could go into developing more desirable vegetarian options, and into pricing these options favorably. If these notions are simply perceived, UBC food outlets could work on promoting and advertising the vegetarian options available.

Limitations:

With a sample size of 138, we only captured opinions of a fraction of the UBC population. A greater sample size would have given us more nuanced results and more certainty in our findings. Additionally, if we had had a greater time frame for this project, we would have done a test run of our survey. This would have helped us refine our survey, especially the two open ended questions.

The project as a whole was somewhat limited in scope. We focused only on reduction of lamb and beef as the productions of these two live stock animals have a high associated GHG cost. However, future projects should take into consideration the GHG impact of other meat

options as well as vegetarian protein alternatives. Lamb and beef options which are produced in a manner with lower associated GHG emissions could also be considered. Other sustainability issues such as land use, water use, water contamination, or biodiversity were not covered by the scope of our project, nor were animal welfare issues. These are important issues related to a meat heavy diet, and should be considered in future projects.

Recommendations

Our project may be considered as a first or second-generation study on the topic of GHG emissions from food at UBC; as such, the focus is on the primary research and literature reviews. Given the nature of our study, it is more realistic to make broad recommendations that future LFS studies will be able to delve more deeply into. For example, a recommendation to reduce portion sizes may not apply to food venues in which such action has already taken place.

Meatless Monday & Similar events

We suggest putting a delay on events similar to "Meatless Monday." UBC survey respondents deemed this the 'least favorable' strategy given. In addition to this, a thorough study on 1 year of Meatless Monday's events noted that 19% of food outlets experienced an increase in overall sales, while 30% noted a decrease in overall sales (Hopkins, 2012). It is clear that other initiatives must occur in integrating such events before they are held at UBC, in order to prevent such revenue losses. Research suggests that incremental change is most beneficial in creating more sustainable consumers (Dagevos & Voordow, 2013). As such, our recommendations revolve around strategies that do not negatively impact financial profit to UBC Food Services; consumer contentedness is key to encouraging sustainable consumption habits. The UBC community will likely be more receptive to events such as 'World Vegetarian Day' in which an emphasis can be placed on promoting health benefits and other more

consumer-friendly priorities; this is in stark contrast to the 'Meatless Monday' in which the name itself encourages 'restrictive' behavior.

Explore protein substitutions – Focus on Chicken

Our group recommends that UBC Food Services explores the option of increasing the prevalence of chicken-based entrees, and reducing that of lamb & beef entrees. Our group's survey on the UBC community suggests that there is a high degree of support ('acceptability' rating of approximately 3.9/5) for reducing lamb & beef entrees, and increasing alternative meat entrees. Our recommendation of chicken is specific for a reason: In a comprehensive poll done on consumer meat preferences, chicken was highly ranked within respondents who consume meat: "Heavy meat eaters" ranked chicken as their #1 favorite food (Dagevos & Voordow, 2013). "Meat reducers" (the large majority of respondents) ranked chicken as their #2 favorite food, after cheese products (Dagevos & Voordow, 2013). Based on our survey results, this recommendation seems to be more popular than using meatless protein substitutes.

Smaller portions of lamb & beef – Lower price of entrees

Our UBC respondents chose this as their second most acceptable lamb and beef reduction strategy. Research shows that per capita meat consumption in USA has "declined for 4 consecutive years" as of 2013 (Hopkins, 2012). One reason for this suggestion is that consumers tend to react better to less drastic changes – in addition to this, they will benefit from the reduction in price. Beef also ranks very highly in consumer popularity polls; consumers may move on to other providers if beef is simply removed from the menu at one food outlet (Dagevos & Voordow, 2013). This suggestion is not applicable to some of the food outlets in UBC which have already reduced portion sizes accordingly; given the nature of our project, it is recommended that a future LFS study look into extensive menu analysis to determine which

appropriate food outlets to apply this to. In addition to this, fiscal analysis is required in order to make realistic recommendations. Lower prices may also encourage consumer spending in more sustainable foods such as fresh produce.

Locations & Stakeholder Groups

Our group recommends incorporating less-meat strategies in a select few food venues to begin with. Vanier & Totem may prove to be ideal, as sales information is easily accounted for in this relatively closed system. In addition to this, there is less competition from other food outlets present in the general locale of these dining halls; unpopular changes would have a lesser financial impact. In addition to this, the respective head chefs and cooking staff are more easily reached for feedback and support; as such, these recommendations may be considered as early as the summer semester.

Target Population

Our survey has shown that first year students consume on average a greater number of meals on campus per week than other groups of students. Targeting meat reduction strategies to first year students may be useful in two regards. First, it will have a greater overall impact, and it may serve to engrain sustainable diet habits in these students that will be carried throughout their time at UBC, and beyond.

Scenario Evaluation

The intention of our project was to suggest best practices that UBC could put in place in order to reduce the GHG footprint associated with the campus food system. Throughout our work on this project, we constantly evaluated our progress through an initial meeting with our community partner (Lillian Zaremba), consultation with our course instructors (Dr. Andrew Riseman, and Brent Mansfield), and feedback sessions among the members of our group. We

successfully collected primary research through a survey administered in person. We surpassed our goal of 100 survey participants with 138. Overall we found our survey results to be enlightening, and useful in achieving our intention. We were unfortunately unable to schedule a follow up interview with Lillian Zaremba as she is no longer employed by UBC. We did however present our findings to the LFS 450 class, as well as many UBC staff members directly involved with food procurement and production on campus. Our findings and recommendations were well received and generated much conversation among those in attendance. Overall we feel we were successful in fulfilling the goals of this project, and that there is much opportunity for further study.

Personal reflection

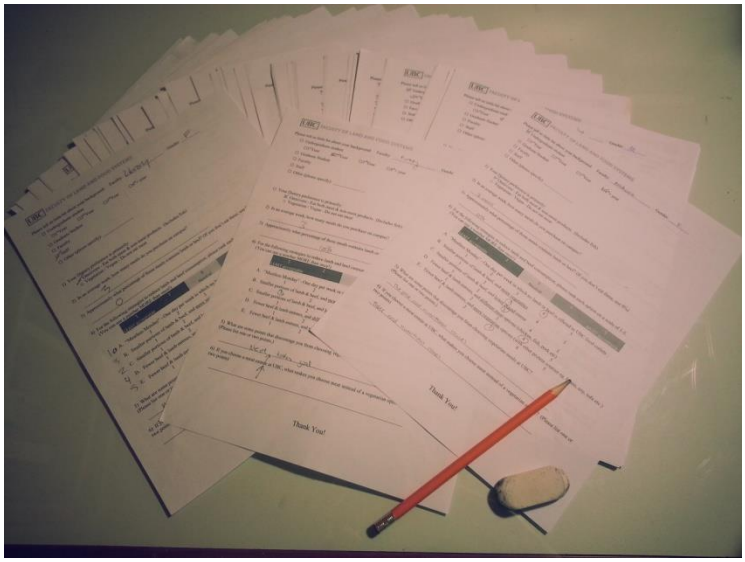
The project outline called for a review of best practices established in other North American campuses, corporations, and other entities. We quickly discovered that there is an extremely limited amount of *specific* information. Organizations that did note less-meat or food GHG-reducing strategies usually did not specify (nor quantify) their action plans. There is a growing amount of primary literature available on this topic, however; it is in this way that UBC has a prime opportunity to establish itself as a leader in this field. As such, it was a bit difficult to make specific and quantifiable recommendations to the university. The main benefit of our research will be seen when future LFS studies are able to pinpoint areas in which they will focus their UBC FSP project on.

Using survey as a method of research was the right choice for this project, since there is not a lot of research done on this subject. The survey design was a difficult process as we had to make sure the wording of the questions were clear and concise so that we can get the answers

that we wanted. Conducting the surveys was a pleasant experience; all of the participants were friendly and easily approachable. This experience helped us developed our communication skills.

Media Release

Our project aims at reducing meat consumption on UBC campus, especially lamb and beef, in order to achieve the goals of the UBC climate action plan to reduce Greenhouse Gas (GHG) emissions. Through literature reviews, we have identified different strategies to reduce meat consumptions on university campuses, and we have conducted surveys at different locations on the UBC campus to understand students' food preferences and their attitudes for the different strategies for meat consumption reductions. The results were very interesting that the least favorable strategy chosen by the participants was "Meatless Monday", and that many students are not buying vegetarian items because of the taste. Although we've only had 138 responses, we think that these surveys are very valuable because they represent the voices of the consumers of the food outlets on campus and the results are useful for implementing changes to the current food services to achieve a lower GHG emission.



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